What is claimed is:

1.　A liquid injector for injecting at least one liquid into a patient, comprising:

5　　　at least one injection performing means for performing injection of the liquid;

screen displaying means for displaying a condition screen with its vertical axis representing an injection rate of the liquid and its horizontal axis representing an injection time period of the liquid;

10　　　condition entering means for accepting an input action of at least one injection condition including an injection rate of the liquid relative to the injection time period;

condition storing means for storing the entered injection condition;

image producing means for producing a condition image having a

15　horizontal width corresponding to the injection time period and including at least the injection rate as text data for each of the injection conditions;

image displaying means for displaying the at least one produced condition image in the condition screen at a vertical position in association with the injection rate and a horizontal position in association with the

20　injection time period;

state detecting means for measuring at least the elapsed time from the start of the injection of the liquid; and

injection control means for controlling the operation of the injection performing means in real time in accordance with the measured elapsed time

25　and the stored injection condition.

2. A liquid injector according to claim 1, further comprising quantity calculating means for calculating an injection quantity of the liquid for each of the injection conditions,

wherein the image producing means produces the condition image

5 also including the injection quantity as text data.

3. A liquid injector for injecting at least one liquid into a patient, comprising:

at least one injection performing means for performing injection of the

10 liquid;

screen displaying means for displaying a condition screen with its vertical axis representing an injection rate of the liquid and its horizontal axis representing an injection quantity period of the liquid;

condition entering means for accepting an input action of at least one

15 injection condition including an injection time period of the liquid relative to the injection quantity;

condition storing means for storing the entered injection condition;

image producing means for producing a condition image having a horizontal width corresponding to the injection-quantity and including at

20 least the injection rate as text data for each of the injection conditions;

image displaying means for displaying the at least one produced condition image in the condition screen at a vertical position in association with the injection rate and a horizontal position in association with the injection quantity;

25 state detecting means for detecting at least the injection quantity from the start of the injection of the liquid; and

injection control means for controlling the operation of the injection performing means in real time in accordance with the detected injection quantity and the stored injection condition.

5   4.   A liquid injector according to claim 3, further comprising time period calculating means for calculating an injection time period of the liquid for each of the injection conditions,

wherein the image producing means produces the condition image also including the injection time period as text data.

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5.   A liquid injector according to any one of claims 1 to 4, wherein the condition entering means accepts an input action of a plurality of the injection conditions for the one injection performing means,

the condition storing means stores a plurality of the injection
15   conditions,

the image displaying means displays the plurality of the produced condition images sequentially arranged horizontally in the condition screen, and

the injection control means sequentially controls the operation of the
20   one injection performing means in accordance with the plurality of the injection conditions.

6.   A liquid injector according to any one of claims 1 to 5, comprising a plurality of the injection performing means,

25   wherein the condition entering means accepts an input action of at least one of the injection conditions for each of a plurality of the liquids,

' the condition storing means stores a plurality of the injection conditions, and

the injection control means sequentially controls the operation of the plurality of the injection performing means in accordance with the plurality of the injection conditions.

7. A liquid injector according to any one of claims 1 to 6, comprising a plurality of the injection performing means,

wherein the image producing means produces the condition image in a difference color for each of the liquids, and

the image displaying means displays the produced condition image for each of the liquids in a different color in the condition screen.

8. A liquid injector according to any one of claims 1 to 7, wherein the condition entering means accepts an input action to move the condition image displayed by the image displaying means upward and/or downward and to move both of lateral ends of the condition image leftward and/or rightward.

9. A liquid injector according to any one of claims 1 to 8, further comprising:

rate storing means for storing an upper limit rate of the liquid injection in advance; and

an alarm outputting means for outputting an alarm when the injection rate of the stored injection condition exceeds the upper limit rate.

10. A liquid injector according to claim 9, wherein the alarm outputting

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means causes the image displaying means to display the condition image of the injection condition including the injection rate higher than the upper limit rate in a dedicated color.

5   11.   A liquid injector according to claim 9 or 10, wherein the alarm outputting means causes the image displaying means to blink the condition image of the injection condition including the injection rate higher than the upper limit rate.

10   12.   A liquid injector according to any one of claims 9 to 11, wherein the alarm outputting means causes the image displaying means to display an alarm image added to the condition image of the injection condition including the injection rate higher than the upper limit rate.

15   13.   A liquid injector according to any one of claims 1 to 12, wherein the image displaying means displays a portion of the condition screen equal to or lower than the upper limit rate of the liquid injection in a different color from a color of a portion of the condition screen higher than the upper limit rate.

20   14.   A liquid injector according to any one of claims 1 to 13, further comprising review entering means for accepting an input action of a review instruction,

   wherein the image displaying means enlarges the text data of the condition image when the review instruction is entered.

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   15.   A liquid injector according to claim 14, wherein the image producing

means produces the text data of the condition image as a combination of a numerical value and its unit, and

the image displaying means enlarges only the text data of the numerical value when the review instruction is entered.

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16. A liquid injector according to claim 15, wherein the image displaying means displays the text data of the unit outside the condition image when the review instruction is entered.

10 17. A liquid injector according to any one of claims 14 to 16, further comprising a cylinder holding mechanism for removably holding a cylinder member of a liquid syringe including the cylinder member filled with the liquid and a piston member slidably inserted into the cylinder member,

wherein the injection performing means comprising a piston

15 actuating mechanism for sliding the piston member of the held liquid syringe,

the image displaying means is placed at a position separate from the cylinder holding mechanism and the piston actuating mechanism, and

the review entering means is placed at a position close to the cylinder holding mechanism and the piston actuating mechanism.

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18. A liquid injector according to any one of claims 1 to 17, further comprising a display panel for performing display of various data and a cylinder holding mechanism for removably holding a cylinder member of a liquid syringe including the cylinder member filled with the liquid and a

25 piston member slidably inserted into the cylinder member,

wherein the injection performing means comprising a piston

actuating mechanism for sliding the piston member of the held liquid syringe,

the screen displaying means causes the display panel to display the condition screen, and

the display panel is provided together with at least one of the cylinder

5   holding mechanism and the piston actuating mechanism.

19.   A liquid injector according to any one of claims 1 to 17, further comprising a touch panel for performing display and accepting an input action of various data,

10   wherein the screen display means causes the touch panel to display the condition screen,

the condition entering means accepts an input action of the injection condition on the touch panel, and

the image displaying means causes the touch panel to display the

15   image of the injection condition.

20.   A liquid injector according to claim 19, further comprising a cylinder holding mechanism for removably holding a cylinder member of a liquid syringe including the cylinder member filled with the liquid and a piston

20   member slidably inserted into the cylinder member,

wherein the injection performing means comprising a piston actuating mechanism for sliding the piston member of the held liquid syringe, and

the touch panel is provided together with at least one of the cylinder

25   holding mechanism and the piston actuating mechanism.

21.　A liquid injector according to any one of claims 1 to 20, wherein the condition storing means stores at least one of the injection condition of previous injection and the injection condition as a default,

the image producing means produces the condition image from the 5　injection condition stored before new entry of the injection condition, and

the condition entering means accepts edit operation of the injection condition displayed on the condition screen as an input action of the new injection condition.

10　22.　A liquid injector according to any one of claims 1 to 21, further comprising image storing means for storing schematic images of a plurality of body sections of a human body and schematic images of a number of regions to be imaged in relation to each other, section displaying means for displaying the schematic images of the plurality of body sections in the shape of a 15　human body, section entering means for accepting an input action to select one of the plurality of displayed body sections, region displaying means for displaying a schematic image of at least one of the regions to be imaged in association with the selected body section, and section entering means for accepting an input action to select the displayed region to be imaged,

20　　wherein the injection performing means injects at least a contrast media as the liquid to the patient whose fluoroscopic image is to be imaged by an imaging diagnostic apparatus,

the condition entering means accepts an input action of the injection condition for each of the number of regions to be imaged of a human body,

25　　the condition storing means stores the injection condition for each of the regions to be imaged, and

the injection control means controls the operation of the injection performing means in accordance with the injection condition of the selected region to be imaged.

5   23.   A liquid injector according to any one of claims 1 to 21, further comprising image storing means for storing schematic images of a plurality of body sections of a human body and schematic images of a number of regions to be imaged in relation to each other, section displaying means for displaying the schematic images of the plurality of body sections in the shape of a

10   human body, section entering means for accepting an input action to select one of the plurality of displayed body sections, region displaying means for displaying a schematic image of at least one of the regions to be imaged in association with the selected body section, section entering means for accepting an input action to select the displayed region to be imaged, and

15   condition correcting means for correcting the data of the injection condition in accordance with the selected region to be imaged,

wherein the injection performing means injects at least a contrast media as the liquid to the patient whose fluoroscopic image is to be imaged by an imaging diagnostic apparatus, and

20   the injection control means controls the operation of the injection performing means in accordance with the corrected injection condition.

24.   A liquid injector according to claim 23, further comprising:

coefficient storing means for storing a predetermined coefficient for

25   each of the regions to be imaged of the patient; and

coefficient reading means for reading the data of the coefficient from

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the coefficient storing means based on the selected region to be imaged,

wherein the condition correcting means increases and/or reduces at least one of the injection rate, the injection time period, and the injection quantity in accordance with the read coefficient.

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25.   A liquid injector according to any one of claims 1 to 24, further comprising:

body entering means for accepting data of details of the body of the patient; and

10   condition correcting means for correcting the data of the injection condition in accordance with the entered data of the details of the body.

26.   A liquid injector according to claim 25, wherein the body entering means accepts the data of the weight of the patient as the details of the body,

15   and

the condition correcting means increases and/or reduces at least one of the injection rate, the injection time period, and the injection quantity in accordance with the entered weight.

20   27.   A liquid injector according to any one of claims 1 to 26, wherein the injection performing means injects at least a contrast media as the liquid to the patient whose fluoroscopic image is to be imaged by an imaging diagnostic apparatus,

a plurality of the contrast media with different effective components

25   are used,

further comprising type entering means for accepting data of a type of

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the contrast media; and

        condition correcting means for correcting the data of the injection condition in accordance with the entered data of the type of the contrast media.

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        28.   A liquid injector according to claim 27, wherein a plurality of the contrast media containing effective components at different concentrations are used,

        further comprising concentration storing means for storing the

10   concentration for each type of the contrast media and concentration reading means for reading the data of the concentration from the concentration storing means based on the entered data of the type of the contrast media,

        wherein the condition correcting means increases and/or reduces at least one of the injection rate, the injection time period, and the injection

15   quantity in accordance with the read data of the concentration.

        29.   An imaging diagnostic system comprising an imaging diagnostic apparatus for imaging a fluoroscopic image of a patient and a liquid injector for injecting at least a contrast media to the patient whose fluoroscopic image

20   is to be taken,

        wherein the imaging diagnostic system comprises the liquid injector according to any one of claims 1 to 28, the liquid injector injects the contrast media as the liquid to the patient, and the liquid injector and the imaging diagnostic apparatus communicate various data with each other to cooperate

25   various operations thereof.

30.   A method of injecting a liquid using the liquid injector according to claim 1, comprising:

a screen displaying step of displaying a condition screen with its vertical axis representing an injection rate of the liquid and its horizontal

5   axis representing an injection time period;

a condition entering step of accepting an input action of at least one injection condition made of the injection rate of the liquid relative to the injection time period;

a condition storing step of storing the entered injection condition;

10   an image producing step of producing a condition image having a horizontal width corresponding to the injection time period and including at least the injection rate as text data for each of the stored injection conditions;

an image displaying step of displaying the at least one produced condition image in the condition screen at a vertical position in association

15   with the injection rate and a horizontal position in association with the injection time period;

a state detecting step of measuring at least the elapsed time from the start of the injection of the liquid; and

an injection control step of controlling the operation of the injection

20   performing step in real time in accordance with the measured elapsed time and the stored injection condition.

31.   A computer program for the liquid injector according to claim 1, the program causing the liquid injector to perform:

25   screen displaying processing of displaying a condition screen with its vertical axis representing an injection rate of the liquid and its horizontal

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axis representing an injection time period;

        condition entering processing of accepting an input action of at least one injection condition made of the injection rate of the liquid relative to the injection time period;

5   condition storing processing of storing the entered injection condition;

        image producing processing of producing a condition image having a horizontal width corresponding to the injection time period and including at least the injection rate as text data for each of the stored injection conditions;

        image displaying processing of displaying the at least one produced

10   condition image in the condition screen at a vertical position in association with the injection rate and a horizontal position in association with the injection time period;

        state detecting processing of measuring at least the elapsed time from the start of the injection of the liquid; and

15   injection control processing of controlling the operation of the injection performing processing in real time in accordance with the measured elapsed time and the stored injection condition.

32.   An information storage medium storing the computer program

20   according to claim 31 for the liquid injector according to claim 1.